

Engineering Design File 1547

Staging, Storage, Sizing, and Treatment Facility (SSSTF)

SSSTF/ICDF Operational Scenario and Process Flows

[The following statement is optional:
Prepared for:
U.S. Department of Energy
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1. Project File No.: 020996 2. Project/Task: SSSTF

3. Subtask: SSSTF/ICDF Operational Scenario and Process Flows

4. Title: SSSTF/ICDF Operational Scenario and Process Flows

5. Summary:

This document contains the engineering process diagrams, process descriptions, safety requirements, and system operation and maintenance scenarios for the Staging, Storage, Sizing, and Treatment Facility (SSSTF). These sections of the document are the basis for design and operations at the SSSTF. The SSSTF technical and functional requirements document, *Conceptual Design Report for the Staging, Storage, Stabilization, and Treatment Facility*, Rev. 1, DOE/ID-10769, dated July 2000, and the *Waste Inventory Design Basis*, Engineering Design File (EDF)-1540 form the basis for this EDF. This EDF will assist in the definition of project requirements and support 30% design activities. The diagrams will be updated throughout the project, as needed.

The EDF is broken into two major sections.

1. Engineering process diagrams and calculations. The diagrams show the basic process flows for waste receiving, verification, treatment, and disposal operations of the SSSTF/INEEL CERCLA Disposal Facility (ICDF), including
 - a) Legend, LEG-0
 - b) Block Flow Diagram, BFD-1
 - c) Decision Diagrams, DEC-1, -2, -3
 - d) Process Flow Diagrams, PFD-1 through PFD-6.

The calculations include

- a) Schedules of waste receipt for waste reported in CERCLA Waste Inventory Database (CWID)
- b) Modified waste receipt schedules
- c) Calculations of processing rates
- d) Estimates of manpower requirements.

2. Process Descriptions.

Summary:

Major conclusions of this EDF are:

1. A modified waste receipt schedule to level the loading is recommended.
2. Based on this modified waste receipt schedule, the design processing rates are
 - a. Landfill Waste - 75,577 yd³/yr
 - 494 yd³/day
 - 38 roll-off containers/day
 - b. Stabilization Waste - 11,110 yd³/yr
 - 73 yd³/day
 - 6 roll-off containers/day
 - c. Well Purge/Development Water
 - 202,850 gal/yr

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- 1,326 gal/day
- < 1 - 5000gal tanker truck

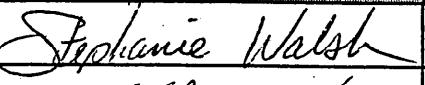
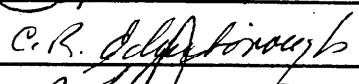
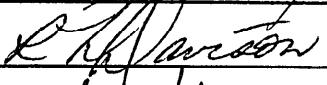
- d. Maximum shipments/day through receiving = 44 roll-offs/day
- e. Total manpower requirements = 15 people.

6. Distribution (complete package):

C. Kingsford, MS 3650, S. Davies, MS 3650, R. L. Davison, MS 3953, Howard Forsythe, MS 3953.
Distribution (summary package only):

7. Review (R) and Approval (A) Signatures:

(Minimum reviews and approvals are listed. Additional reviews/approvals may be added.)

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Approver/ Project Engineer	A	S. A. Davies, P. E.		12/19/00



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ACRONYMS

AOC	Area of Contamination
ARAR	Applicable or Relevant and Appropriate Requirement
BFD	Block Flow Diagram
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CWID	CERCLA Waste Inventory Database
cy	cubic yard
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EDF	Engineering Design File
EPA	U.S. Environmental Protection Agency
ES&H	Environment, Safety, and Health
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
IDW	investigation-derived waste
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LDR	Land Disposal Restriction
O&M	Operations and Maintenance
OU	Operable Unit
PCB	Polycholorinated Biphenyl
PFD	Process Flow Diagram
QA	quality assurance
RCRA	Resource Conservation and Recovery Act

RD/RA	Remedial Design/Remedial Action
ROD	Record of Decision
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex
SSSTF	Staging, Storage, Sizing, and Treatment Facility
T&FR	Technical and Functional Requirements
TRU	transuranic
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and/or disposal
WAC	Waste Acceptance Criteria
WAG	Waste Area Group
WPS	Waste Profile Sheet

DEFINITIONS

Special Case Waste: Waste identified by the waste profile sheet that requires special consideration in order to enter the complex. These wastes include, but are not limited to:

- Low volume anomalous waste
- Waste that may require off-site disposition
- Waste outside WAC, but with additional processing may be acceptable
- Waste requiring additional engineering controls prior to processing
- Waste requiring additional administrative controls (project definition).

Staging, Storage, Sizing, and Treatment Facility (SSSTF) SSSTF/ICDF Operational Scenario and Process Flows

1. INTRODUCTION

The U.S. Department of Energy Idaho Operations Office (DOE-ID) authorized a remedial design/remedial action (RD/RA) for the Idaho Nuclear Technology and Engineering Center (INTEC) in accordance with the Waste Area Group (WAG) 3, Operable Unit (OU) 3-13 Record of Decision (ROD).¹

The ROD requires Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation wastes generated within the Idaho National Engineering and Environmental Laboratory (INEEL) boundaries to be removed and disposed of on-site in the INEEL CERCLA Disposal Facility (ICDF). The ICDF, which will be located south of INTEC and adjacent to the existing percolation ponds, will be an on-site, engineered facility, meeting DOE Order 435.1, Resource Conservation and Recovery Act (RCRA) Subtitle C, and Toxic Substances Control Act (TSCA) polychlorinated biphenyl (PCB) landfill design and construction requirements. The ICDF will include the necessary subsystems and support facilities to provide a complete waste disposal system.

The major components of the ICDF are the disposal cells, an evaporation pond, and the Staging, Storage, Sizing, and Treatment Facility (SSSTF). The disposal cells, including a buffer zone, will cover approximately 40 acres, with a disposal capacity of about 510,000 yd³. Current projections of INEEL-wide CERCLA waste volumes total about 483,800 yd³ DOE Order 435.1. The SSSTF will be designed to provide centralized receiving, inspection, and treatment necessary to stage, store, and treat incoming waste from various INEEL CERCLA remediation sites prior to disposal in the ICDF, or shipment off-site. All SSSTF activities shall take place within the WAG 3 area of contamination (AOC) to allow flexibility in managing the consolidation and remediation of wastes without triggering Land Disposal Restrictions (LDRs) and other RCRA requirements, in accordance with the OU 3-13 ROD. Only low-level, mixed low-level, hazardous, and limited quantities of TSCA wastes will be treated and/or disposed of at the ICDF. Most of the waste will be contaminated soil, but debris and Investigative Derived Waste (IDW) will also be included in the waste inventory. ICDF leachate, decontamination water and water from CERCLA well purging, sampling, and well development activities will also be disposed of in the ICDF evaporation pond.

Only INEEL on-site CERCLA wastes meeting the agency approved Waste Acceptance Criteria (WAC) will be accepted at the ICDF. An important objective of the WAC will be to ensure that hazardous substances disposed in the ICDF will not result in exceeding groundwater quality standards in the underlying groundwater aquifer. Acceptance criteria will include restrictions on contaminant concentrations based on groundwater modeling results with the goal of preventing potential future risk to the Snake River Plain Aquifer (SRPA).

This document contains the engineering process diagrams, process descriptions, safety requirements, and system operation and maintenance scenarios for the SSSTF. These sections of the document are the basis for design and operations at the SSSTF. The SSSTF technical and functional requirements (T&FR) document, *Conceptual Design Report for the Staging, Storage, Stabilization, and Treatment Facility*, Rev. 1, DOE/ID-10769,² (CDR) and the *Waste Inventory Design Basis*, Engineering Design File (EDF)-1540³ form the basis for this EDF.